

AMENDMENTS TO THE CLAIMS:

Applicants cancel claims 41 through 66 and provide new claims 67 through 88. New Claims 67 through 88 correspond generally to canceled Claims 41 through 66.

Listing of Claims:

1- 66 (cancelled)

67 (new): A method for directing reactions between ligand molecules and target molecules, comprising the steps of:

providing a unit having a plurality of individually addressable micro-electromagnetic cores;

forming a functional layer for immobilizing ligand molecules above said cores;

providing modified ligand molecules capable of being positioned by magnetic fields;

disposing a solution containing said modified ligand molecules on said functional layer;

creating a pattern of immobilized ligand molecules by selectively energizing said cores to form magnetic fields which position said modified ligand molecules at predetermined locations where said ligand molecules become immobilized on said functional layer;

providing modified target molecules able to be positioned by magnetic fields;

disposing a solution containing said modified target molecules on said pattern of immobilized ligand molecules; and

selectively energizing said cores to form magnetic fields which position said modified target molecules in juxtaposition to predetermined immobilized ligand molecules thereby directing a reaction between said target molecules and said ligand molecules.

68 (new): The method of Claim 67, further comprising a step of detecting said reaction between said target molecules and said ligand molecules.

69 (new): The method of Claim 68, wherein the step of detecting said reaction comprises optical detection.

70 (new): The method of Claim 67, wherein said functional layer is selected from the group consisting of a hydrophilic molecular monolayer, a hydrophilic molecular monolayer with functional groups, a hydrophobic molecular monolayer, a hydrophobic molecular monolayer with functional groups, a hydrophilic membrane, a hydrophilic membrane with functional groups, a hydrophobic membrane, a hydrophobic membrane with functional groups, a hydrophilic gel, a hydrophilic gel with functional groups, a hydrophobic gel, a hydrophobic gel with functional groups, a porous material, a porous material with functional groups, a non-porous material and a non-porous material with functional groups.

71 (new): The method of Claim 70, wherein said functional groups are selected from the group consisting of aldehydes, carbodiimides, succinimydyl esters, antibodies, receptors, and lectins.

72 (new): The method of Claim 67, wherein said modified ligand molecules are ligand molecules linked to magnetic material.

73 (new): The method of Claim 72, wherein said ligand molecules are linked to magnetic material by a cleavable linker.

74 (new): The method of Claim 73, wherein said cleavable linker is cleavable by light, heat, enzymatic activity or chemical reaction.

75 (new): The method of Claim 72, wherein said ligand molecules are linked to magnetic material by a covalent bond.

76 (new): The method of Claim 72, wherein said ligand molecules are linked to magnetic material by biological affinity to a molecule coupled to said magnetic material.

77 (new): The method of Claim 76, wherein said biological affinity is selected from the group consisting of antibody-antigen affinity, lectin-hapten affinity and receptor-ligand affinity.

78 (new): The method of Claim 67, wherein said modified target molecules are target molecules linked to magnetic material.

79 (new): The method of Claim 78, wherein said target molecules are linked to magnetic material by a cleavable linker.

80 (new): The method of Claim 79, wherein said cleavable linker is cleavable by light, heat, enzymatic activity or chemical reaction.

81 (new): The method of Claim 78, wherein said target molecule is linked to magnetic material by a covalent bond.

82 (new): The method of Claim 78, wherein said target molecule is linked to magnetic material by biological affinity to a molecule coupled to said magnetic material.

83 (new): The method of Claim 82, wherein said biological affinity is selected from the group consisting of antibody-antigen affinity, lectin-hapten affinity and receptor-ligand affinity.

84 (new): The method of Claim 67, further comprising the steps of cleaving said modified ligand molecules from a magnetic material or said modified target molecules from a magnetic material or both after the step of selectively energizing magnetic cores, wherein the cleaved modified ligands or cleaved modified target molecules are not substantially positionable by magnetic fields.

85 (new): The method of Claim 84, wherein said magnetic material is removed by a magnetic field.

86 (new): The method of Claim 84, wherein said magnetic material is removed by a fluid wash.

87 (new): The method of Claim 67, wherein said modified ligand molecules are modified by mixing a solution of said ligand molecules with magnetic material, and freezing droplets of ligand molecules mixed with magnetic material to form small solid magnetic particles.

88 (new): The method of Claim 87 further comprising the step of using magnetic dispensers to position the small solid magnetic particles on at least one unit.

86 (new): The method of Claim 67, wherein said modified ligand and said modified target molecules comprise biological molecules, chemical reagents or pharmaceutical molecules.

87 (new): The method of Claim 67, wherein said modified ligand and said modified target molecules comprise nucleic acid molecules.

88 (new): The method of Claim 67, wherein one or both of said modified ligand and said modified target molecules comprise antibodies and antigens.